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(1917 1982)

May 17, 1988

Mr. Keith Schardein
Department of Natural Resources
P. O. Box 176
Jefferson City, MO 65102

Dear Mr. Schardein:

Pursuant to the request of Tom Mullins enclosed please find the Phase I Report submitted to our client by Envirodyne Engineers, Inc.

Sincerely,

DYSART TAYLOR PENNER
LAY & LEWANDOWSKI, P.C.

Charles F. Marvine, Jr.

CFM:ra
enclosure
cc: Mr Tom Mullins
Mr. Kenneth Churchill

DRAFT

PHASE I REPORT

ENVIRONMENTAL INSPECTION OF THE TEN-ACRE PLOT PART OF THE MARK TWAIN INDUSTRIAL PARK

ST. LOUIS, MISSOURI

Churchill Truck Lines, Inc.
Post Office Box 250
Chillicothe, Missouri 64601

Envirodyne Engineers, Inc.
12161 Lackland Road
St. Louis, Missouri 63146

March 1988
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3238-10000

INTRODUCTION

On March 14, 1988, Mr. Kenneth Churchill, President of Churchill Truck Lines, Inc., contacted Envirodyne Engineers, Inc. (EEI) to request assistance in an environmental evaluation of the southern 10 acres of what has been called Tract A. Currently, Tract A is known as the Mark Twain Industrial Park. It was agreed that EEI would conduct a records review and visual inspection of the site (Phase I).

EEI's general approach to the environmental evaluation of a site consists of four phases. In Phase I, EEI performs a records review and on-site inspection to assess the potential presence of environmental contaminants on the property. The second phase, which is conducted only if Phase I results indicate a potential problem, involves the design and implementation of a sampling and analysis program to define the types and concentrations of suspected contaminants. Phase III involves the analysis of data generated and comparison with environmental regulations and criteria. Phase IV (if desired) involves negotiations with state agencies.

In the report which follows, EEI presents the results of Phase I activities with recommendations for future work.

PHASE I

Background/Records Review

The area of interest was once owned and operated by the St. Louis Army Ammunition Plant (SLAAP), which was constructed in 1941. The plant's function was the manufacture and assembly of 30 and 50 caliber cartridges under contract with the Western Cartridge Company. At the end of World War II, the plant was deactivated until the beginning of the Korean War in 1951. The Chevrolet Division of General Motors was contracted to manufacture and assemble 105 millimeter shells during the Korean War.

In 1954, the plant was deactivated, declared Army surplus, and came under the control of the General Services Administration (GSA). Some of the property began to be sold off in a piece-meal fashion. The remaining plant was again reactivated from 1966 to 1969 during the Vietnam War for the production of 105 millimeter shells by Chevrolet. In 1971, Chevrolet closed its contract with the Army, and the plant was deactivated.

A portion of the SLAAP remains under Army ownership as the U.S. Army Aviation Systems Command.

The 10-acre site of interest was sold by GSA to the Missouri Pacific Railroad, who in turn sold the property to the City of St. Louis. The City chose to demolish the site in 1980 for future development.

An interview was conducted with Mr. Thomas Mullen, Assistant Director at the St. Louis Office of Business Development. Mr. Mullen is responsible for the Mark Twain Industrial Park development. In the interview, it was indicated that the SLAAP once manufactured bullets and shells, but the 10-acre site was only used for storage, not for manufacturing.

Previous site conditions, prior to the 1980 demolition, are presented in Figure 2. Mr. Mullen had obtained a drawing of the site that included the buildings, bunkers (119), sewer locations and areas labeled "Transformer Substation," "Chemical Building," and "Powder Sumps."

Mr. Merrill Humphries of the SLAAP indicated that the manufacturing of gunpowder took place in Weldon Springs, Missouri. The 10-acre site was apparently used to store the gunpowder (single based powder containing nitrocellulose or nitroglycerin) in small quantities in service magazines. The finished ammunition product was also stored. The "Chemical Building" was apparently used to store dry chemicals, primarily oxidizers, such as magnesium, strontium peroxide, and barium nitrate, which were used for tracer mixes.

Mr. Humphries explained that the "Powder Sumps" were concrete wells with concrete floors used to pump water from the floor of buildings storing gunpowder. The water and gunpowder residue was then pumped from the sumps and taken to a burning ground off-site. He did not know when the electrical transformers were removed from the substation or by whom.

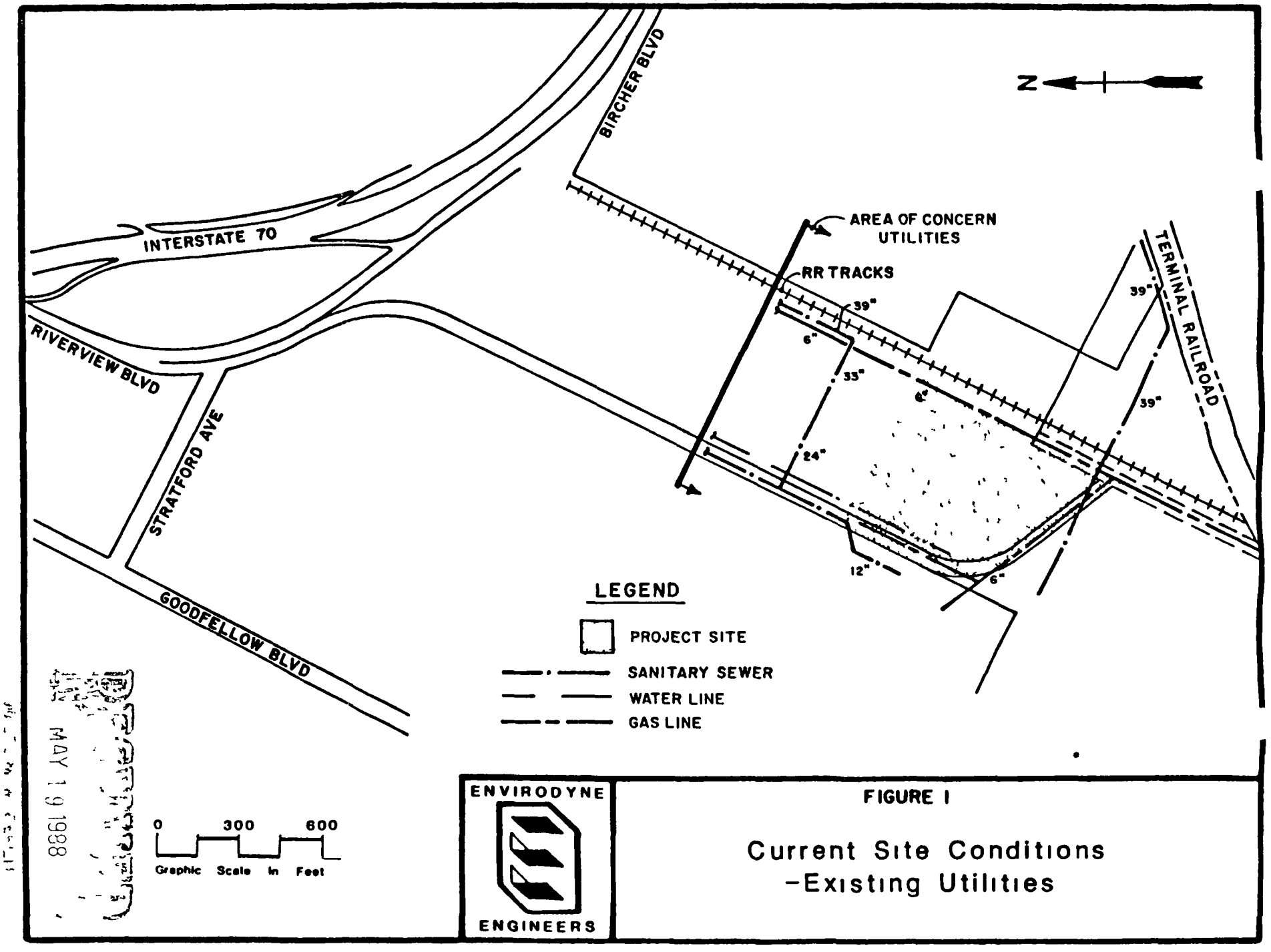
It was indicated by Mr. Mullen that the Army had decommissioned the site prior to the City's purchase. The City chose to demolish the site and regrade it for future development. Mr. Arnold Spirtas of Spirtas Wrecking Company indicated that some asbestos was removed from steam pipes in the buildings and taken off-site according to the U.S. Environmental Protection Agency (USEPA) standards at that time. The wrecking company did not discover any drums or known hazardous substances on the site except for gunpowder and gunpowder residue. Army representatives removed the gunpowder for off-site disposal.

In interviews with Mr. Mullen and Mr. Spirtas, it was indicated that all the utility lines, underground cart transportation tunnels, and sanitary sewer laterals were demolished and removed. The sewer main was left intact but apparently does not transect the 10-acre site. It was indicated that none of the sewers contained industrial sewage. The buildings were demolished and the rubble hauled off-site. The underground bunkers were demolished to a depth of 12 feet, including the floor. The walls continued to an unknown depth beyond 18 feet. The concrete was compacted in the bunker and soil was placed over the top. All of the Mark Twain Industrial Park was regraded after demolition, but no fill was brought in from off-site.

The SLAAP public relations representative, Mr. Howard DeMeer, was given a written request for information under the Freedom of Information Act. A response has not been received to date.

In a West Citizen Journal newspaper article dated March 16, 1988, it was stated "The Army-owned ordnance plant at 4300 Goodfellow Boulevard once was the subject of a Superfund investigation because of contamination by polychlorinated biphenyls or PCBs. The site also was at one time regulated by the Resource Conservation and Recovery Act."

Contact was made with Mr. Greg McKabe of the Superfund Department at the USEPA Region VII office. He indicated that the St. Louis Ordnance Plant (SLOP), is on the USEPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). CERCLIS is a complete record of all site discoveries, preliminary assessments, site investigaions, and hazard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BIRCHER BLVD
INTERSTATE 70
RIVERVIEW BLVD
STRATFORD AVE
GOODFELLOW BLVD
AREA OF CONCERN
UTILITIES
RR TRACKS
TERMINAL RAILROAD
39"
6"
33"
24"
12"
LEGEND
PROJECT SITE
SANITARY SEWER
WATER LINE
GAS LINE
0
300
600
Graphic Scale in Feet
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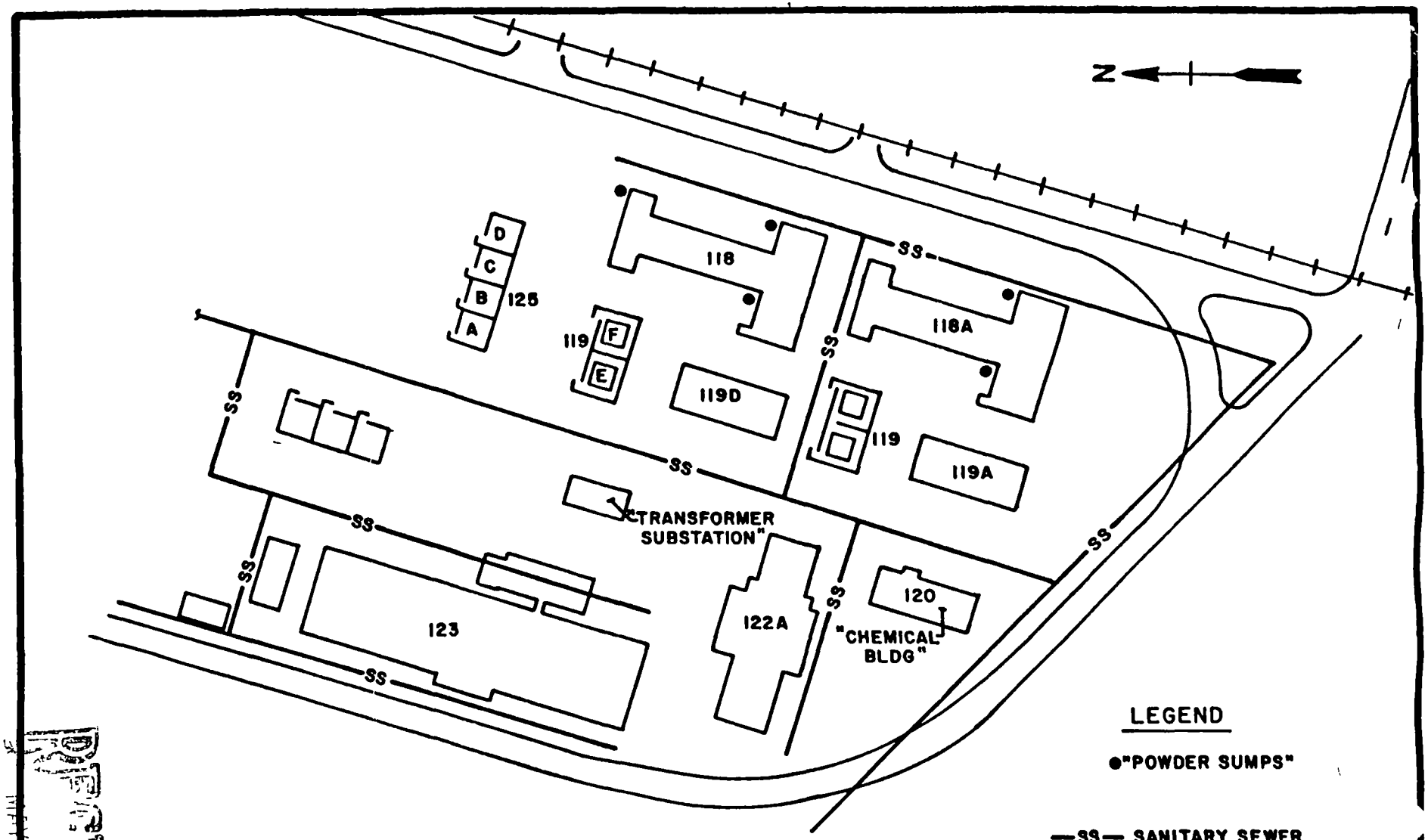
FIGURE 1
Current Site Conditions
-Existing Utilities



ENVIRODYNE ENGINEERS

FIGURE 2

Previous Site Conditions– 10 Acre Area of Interest Part of Mark Twain Industrial Park

rankings collected by the agency. Mr. McKabe indicated that the USEPA is no longer undergoing investigation of the SLOP. The Department of Defense (DOD) is responsible for any further investigation, however, Mr. McKabe does not have any information outlining the DOD's actions. It is not clear as to whether the St. Louis Army Ammunition Plant and the St. Louis Ordnance Plant are the same. Mr. McKabe indicated that the EPA's file does not show PCB contamination at the SLOP as indicated by the newspaper article. The EPA had discovered contamination in the "Hanley area", where explosives were once produced. Mr. Humphries described the Hanley area as the area at the corner of Goodfellow Boulevard and Stratford Avenue. Therefore, the area of EPA investigation did not include the 10-acre plot.

It was indicated by Mr. Jim Belchner of the Missouri Department of Natural Resources that the SLOP was investigated by USEPA in 1984. The USEPA stated that the DOD was responsible for further investigation.

Several DOD contacts have been made, but further information has not been obtained as yet. At this time, it is not certain whether the site is undergoing or is being considered for a DOD environmental investigation. However, this is unlikely since the contamination found by the EPA was not on the 10-acre plot.

Aerial photographs of the 10-acre site (scale 1" = 200 feet) show conditions in 1964 (earliest photo available) and in 1987. These photos do not reveal any tanks, drums or obvious spills.

Visual On-Site Inspection

A visual on-site inspection was conducted on March 14, 1988. The 10-acre plot appeared to be graded and vegetated with grasses. Small concrete rubble piles were occasionally found along the eastern edge of the Mark Twain Industrial Park.

In Figure 1 current site conditions and existing utilities are presented.

CONCLUSIONS

Based upon EEI's site visit and record review activities, the following major conclusions are presented for consideration.

1) The 10-acre site was apparently used only for storage not manufacturing. The sewers were for sanitary waste and storm runoff, not for industrial purposes.

2) There were no signs of spillage or environmental contamination during the site visit. However, the site has undergone major demolition and regrading, possibly covering any environmental indicators or surface contamination.

3) Old drawings of the site reveal potential contaminant areas the "transformer substation", "chemical building", and "powder sumps".

4) The "transformer substation" could be a source of PCB contamination from the oil used in old transformers.

5) The "c nical building" apparently contained dry che cals, mainly oxidizers, such as magnesium, strontium peroxide, and barium nitrate, possible sources of contamination.

6) The bunkers and buildings were used to store gunpowder (nitrocellulose or nitroglycerine based) and/or the finished ammunition product, also a possible contamination source.

7) The "powder sumps" previously contained gunpowder residue, again a possible source of contamination.

8) Since the entire Mark Twain Industrial Park has been regraded, there is the possibility that any contaminated soil has been spread out, pushed into pockets, pushed off-site, or remains near the source. The possibility exists that contaminants from other areas of the Industrial Park were spread onto the 10-acre plot during regrading. However, any "neighboring" contaminants would most likely be the same as those suspected on the 10-acre plot due to the history and previous operations of the Industrial Park.

Recommendations

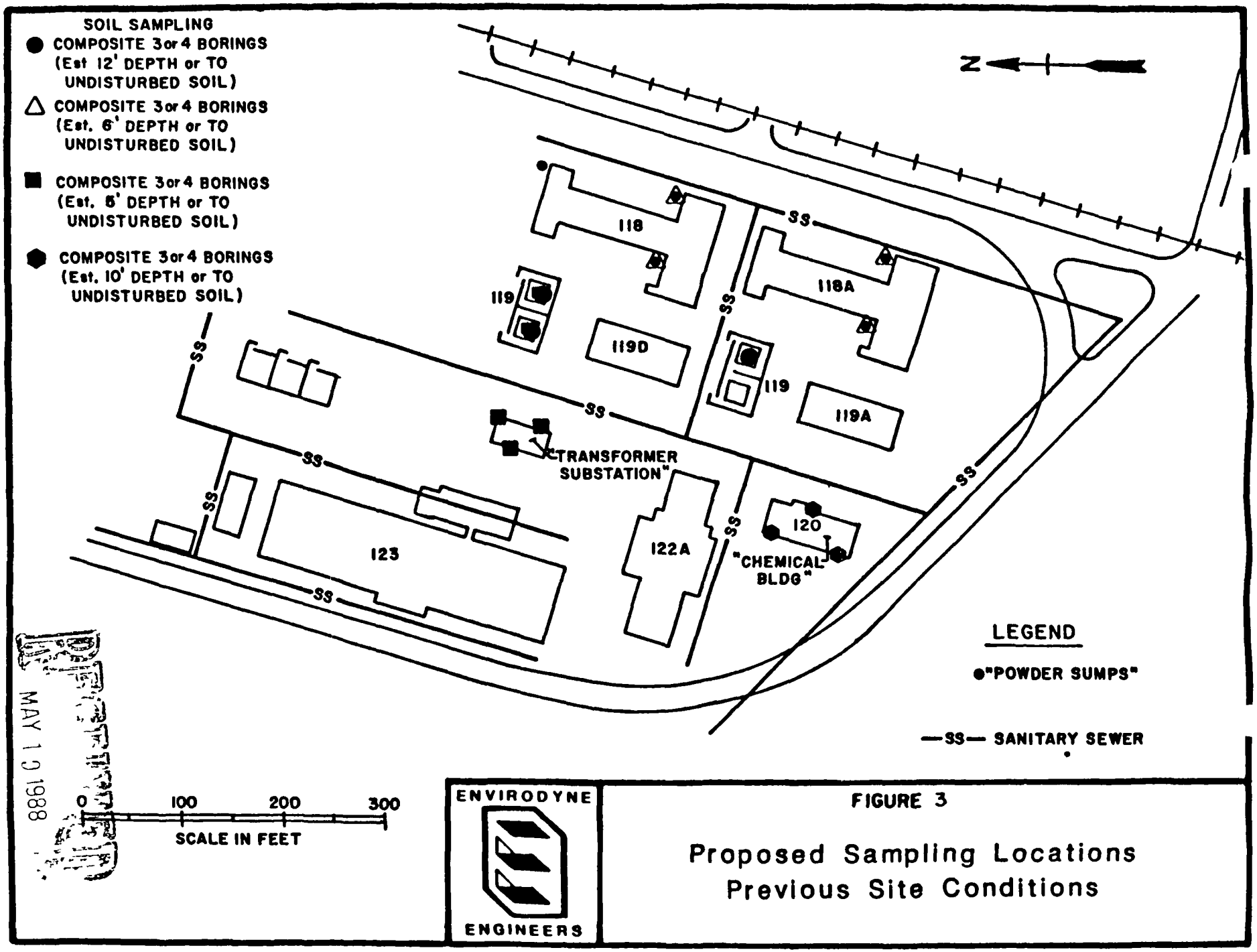
Based upon the conclusions previously discussed, the following recommendations are presented for consideration.

1) It is recommended that soil samples be taken around the "transformer substation" area (Figure 3) and analyzed for PCB's. If the soil is undisturbed (natural soil horizons), a composite of three to four five-foot borings would comprise one PCB sample. PCB's are not very soluble in water, so contamination would be expected to remain relatively close to the ground surface. If the soil is disturbed (fill/rubble), it is recommended that two samples be collected One composite from three to four borings or disturbed soil and one composite from three to four borings of the underlying undisturbed soil.

2) It is recommended that a soil composite of three to four borings around the "chemical building" be collected and analyzed for barium, due to its toxicity. EEI does not see a need to analyze for Mg, since this metal is commonly found in the soil or for strontium due to its low toxicity. Previously mentioned in EEI's proposal were compounds found at other similar ordnance works, such as volatile organic compounds, lead, chromium, and mercury. These compounds were associated mainly with manufacturing or sewer disposal which is not a concern of this 10-acre plot and therefore not recommended analyses.

   If the soil is undisturbed, one composite would be collected from approximately a 10-foot depth. Two composite samples would be collected if the soil is disturbed one from the disturbed soil and one from the underlying undisturbed soil.

3) A soil composite of 3-4 borings near the bunkers is recommended. This soil would be analyzed for total nitroaromatics, nitrocellulose, and total nitrates. The results of the nitrocellulose analysis, would include the presence of all nitrates. Therefore the total nitrates result would be subtracted, giving a truer value of nitrocellulose.



If the soil is either undisturbed or disturbed, one composite would be collected from approximately a 12-foot depth. It is not necessary to go beyond 12-feet since this is where the bunker floor was said to be located. However, if the soil is disturbed and undisturbed soil is encountered before 12 feet, two samples will be collected, one from each layer.

4) It is recommended that a soil composite of 3-6 borings be taken around the "powder sumps", which were said to be located near gunpowder storage buildings. This soil would be analyzed for total nitroaromatics, nitrocellulose, and total nitrates.

   If the soil is undisturbed, one composite would be taken from approximately a 6-foot depth. Again, if the soil is disturbed, one sample would be collected from the disturbed soil and one from the underlying undisturbed soil.

5) It is recommended that this environmental evaluation be extended. Phase II (implementation of a sampling and analysis program to define the types and concentrations of suspected contaminants) and Phase III (analysis of data generated and comparison with environmental regulations and criteria) are recommended.